

LECTURE – II

SPATIAL ANALYSIS (INTERPOLATION)

Course Instructor:

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- Spatial Interpolation
- Methods of Spatial Interpolation
- Spatial Interpolation in QGIS

Spatial Interpolation

- It is the process of using points with known values to estimate values at other unknown points.
- For example, to make a precipitation (rainfall) map for your country, you will not find enough evenly spread weather stations to cover the entire region.
- Spatial interpolation can estimate the temperatures at locations without recorded data by using known temperature readings at nearby weather stations.
- Elevation data, precipitation, snow accumulation, water table and population density are other types of data that can be computed using interpolation.

Spatial Interpolation

■ Importance of Spatial Interpolation

- Because of high cost and limited resources, data collection is usually conducted only in a limited number of selected point locations.

Methods of Spatial Interpolation

- In order to generate a continuous map, for example, a digital elevation map from elevation points measured with a GPS device, a suitable interpolation method has to be used to optimally estimate the values at those locations where no samples or measurements were taken.
- Two methods are widely used:
 1. Inverse Distance Weighting (**IDW**), and
 2. Triangulated Irregular Networks (**TIN**)

Methods of Spatial Interpolation

■ Inverse Distance Weightage (IDW)

- In the IDW interpolation method, the sample points are weighted during interpolation such that the influence of one point relative to another declines with distance from the unknown point you want to create

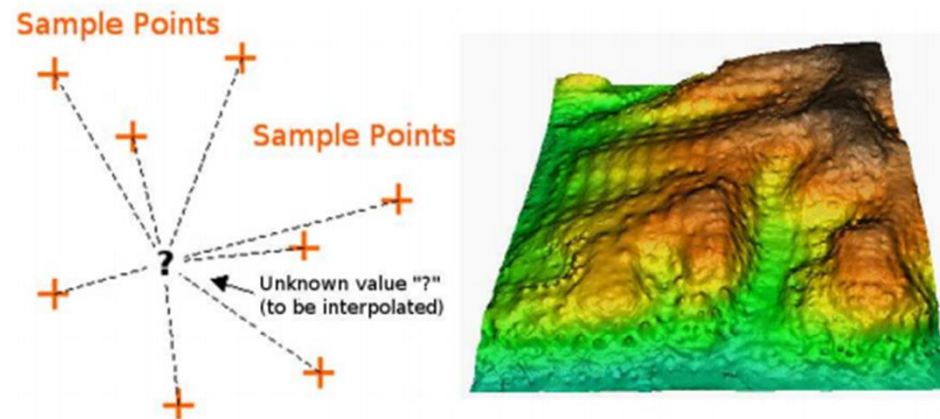


Image Source: Mitas, L., Mitsova, H. (1999)

Methods of Spatial Interpolation

■ Triangulated Irregular Network (TIN)

- In the TIN interpolation method, a surface formed by triangles of nearest neighbor points.
- To do this, circumcircles around selected sample points are created and their intersections are connected to a network of non overlapping and as compact as possible triangles

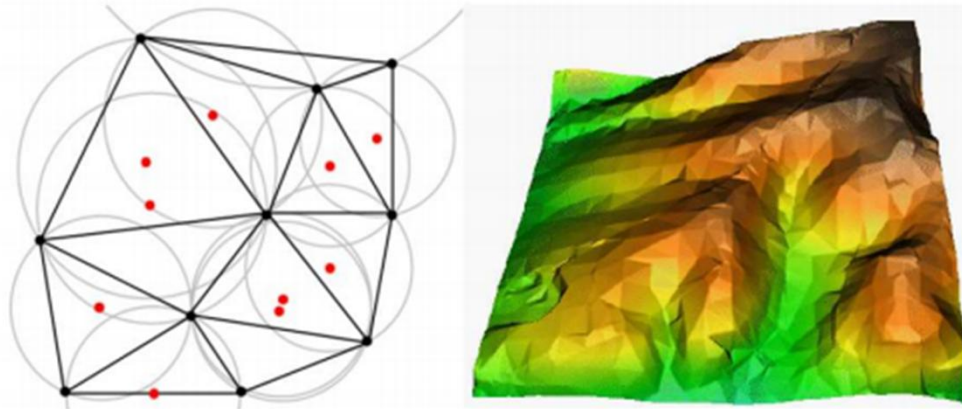
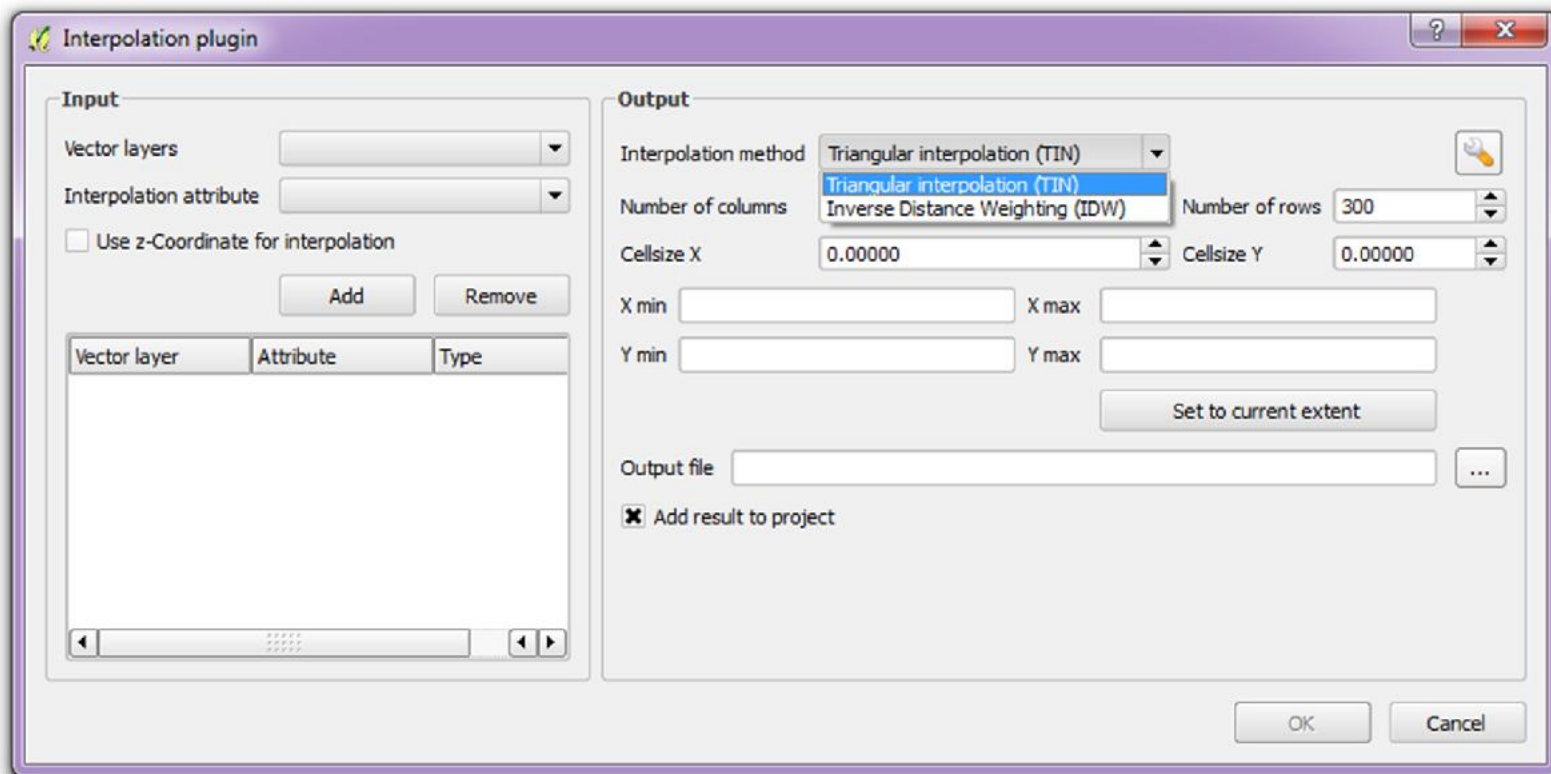


Image Source: Mitas, L., Mitasova, H. (1999)

Spatial Interpolation in QGIS

- Spatial Interpolation is carried out using **Interpolation plugin** (installed by default)
- **Command Path:** Raster > Interpolation > Interpolation



References

- QGIS Training Manual
- A Gentle Introduction to GIS